BLS900

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Large Aperture Scintillometer – Dual-Disk Design

Photo courtesy of CSIR, South Africa

The Scintec BLS900 Large Aperture Scintillometer measures atmospheric turbulence, heat flux and crosswind over path lengths between 250 m and 6000 m. As part of a meteorological station it can also be used to determine the evapotranspiration over extended areas.

A scintillometer senses turbulence between an optical transmitter and a receiver. The operation principle is based on the modulation of light by atmospheric refractive index fluctuations in the air. The phenomenon is called scintillation and is the reason why stars twinkle at night.

Compared to conventional turbulence measurements with point sensors, scintillometers gather spatially representative results with lower statistical scatter and shorter averaging times.

The Dual-Disk Design of the BLS900 provides for instantaneous corrections of absorption fluctuations, saturation of scintillation and outer scale effects. This results in significantly higher data quality and increased measurement ranges. All BLS Series scintillometers use LED arrays. Wide emission angles virtually eliminate the need for transmitter alignment and maintain high data accuracy even when used on towers which are prone to vibration.

Features

- measures turbulence over large spatial scales
- Dual-Disk Design for unrivalled accuracy
- crosswind measurement capability
- maximum path length 6000 m
- LED array eases transmitter alignment
- LED array allows transmitter to be mounted on vibrating towers
- built-in Receiver Alignment Monitor
- Signal Processing Unit performs all calculations
- 6 GB built-in data storage
- remote access
- infrared window heating available

Applications

- surface energy balance
- satellite data ground truth
- plant evapotranspiration
- agrometeorology, forestry
- hydrology, water management
- turbulence studies
- atmospheric dispersion
- optical propagation conditions
- defence weather
- runway crosswind

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BLS900

Boundary Layer Scintillometers

Data output

Data output includes (but is not limited to):

- structure parameter of refractive index fluctuations (C_n^2)
- structure parameter of temperature fluctuations (C_T^2)
- sensible heat flux
- crosswind (horizontal wind component perpendicular to the optical propagation path)
- mean, standard deviation, minimum and maximum of intensity (for each disk)
- scintillation index (at user-defined wavelength and path length)
- Fried diameter (at user-defined wavelength and path length)
- correlation coefficient of intensity
- raw intensity data (for each disk)
- data quality code

Description	Specifications	Remarks
No. of transmitting disks	2	horizontally spaced
No. of LEDs	888 / 36	infrared / visible
Optical output power	15 W peak	at 880 nm wavelength
Transmitter divergence	16°	full width at half maximum
Receiver field of view	8 mrad	receiver alignment automatically monitored
Corrections for absorption fluctuations and outer scale effect	yes	automatic
Crosswind measurement capability	yes	in continuous mode only
Path length	100 / 500 to 6000 m	with / without Path Reduction Aperture
Pulse repetition rates	1, 5, 25 Hz or continuous	
Integration time	1 sec to 60 min	
Output ports	Ethernet, RS-232, analogue	ASCII
Data Storage Capacity	6 GB	
Internal clock	date and time	
Operating voltage	10 to 15 VDC	AC power supply available
Power consumption: Transmitter “Long Path”, “Boost”	60 W / 14 W / 4 W / 2 W	continuous mode / 25 Hz / 5 Hz / 1 Hz pulse repetition rate
Power consumption: Receiver and SPU	16 W	
Operating temperature	-35 to +50°C (-30 to +120°F)	
Dimensions and weight: Transmitter	36 x 18 x 14 cm / 8.5 kg	
Dimensions and weight: Receiver	61 x 32 x 16 cm / 7.6 kg	
Dimensions and weight: SPU	33 x 23 x 18 cm / 8 kg	

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